

S P E C I F I C A T I O N

Docket No. DA9-92-108

G E N E R A L E C O R P S  
C O M P A N Y

**TO ALL WHOM IT MAY CONCERN:**

BE IT KNOWN THAT WE, **William J. Johnson and Michael D. Smith**, are citizens of the United States of America residing in the State of Texas, have invented new and useful improvements in a

**METHOD AND SYSTEM FOR CURSOR APPLIED PROCESSING WITHIN  
A DATA PROCESSING SYSTEM**

of which the following is a specification:

1                   **BACKGROUND OF THE INVENTION**

2                   A'

3    1.    **Technical Field:**

4                   The present invention relates in general to an improved data  
5 processing system and in particular to a method and system for efficiently  
6 executing a predefined process within a data processing system. Still more  
7 particularly, the present invention relates to a graphical technique for  
8 executing a predefined process within the data processing system.

9

10  2.    **Description of the Related Art:**

11                  Data processing systems are becoming increasingly complex  
12 as technology and software become more complicated. As the complexity  
13 of such systems increases, it is of increasing importance to simplify the  
14 interface between a user and the data processing system in order to render  
15 execution of selected tasks within the data processing system more efficient,  
16 if possible.

17

18                  Recently selected software applications have been created  
19 which support the creation and utilization of user defined macros that may be  
20 applied within some context of that application. For example, modern word  
21 processing applications often permit a user to enter a "record" mode and  
22 thereafter specify a series of procedural steps which are to be recorded and  
23 executed each time the user invokes that macro. While such systems permit  
24 a user to define a macro or batch file for execution within a particular context  
25 of an application, no such procedure exists which permits a user to define a  
26 user specified process which may be applied to any number of arbitrarily  
27 selected user interface objects, such as icons, files, documents or the like,  
28 in an application independent manner.

29

1           One reason that such known user defined macros are limited  
2 to a single context is the difficulty in specifying the manner in which the  
3 predefined processes which make up the macro are to be applied to a  
4 particular object within the data processing system. It should thus be  
5 apparent that a need exists for a technique whereby iterative processing of  
6 objects within an electronic desktop may be efficiently performed and applied  
7 to an arbitrary object within a data processing system.

8

DOCKET DA9-92-108

## **SUMMARY OF THE INVENTION**

It is therefore one object of the present invention to provide an improved data processing system.

It is another object of the present invention to provide an improved method and system for efficiently executing a predefined process within a data processing system.

It is yet another object of the present invention to provide a graphical technique for executing a predefined process upon an arbitrary user interface object within a data processing system.

12                         The foregoing objects are achieved as is now described. The  
13                         method and system of the present invention may be utilized to efficiently  
14                         execute a predefined process within a data processing system having multiple  
15                         objects and a movable cursor element displayed therein. A user defined  
16                         executable process is specified within the data processing system which may  
17                         be applied to one or more arbitrary objects within the data processing  
18                         system. The user defined executable process is then associated with the  
19                         movable cursor within the data processing system. Thereafter, each time an  
20                         object is graphically selected within the data processing system utilizing the  
21                         movable cursor, the user defined executable process is applied to the  
22                         selected object. The physical appearance of the movable cursor is preferably  
23                         altered to indicate the association of the user defined executable process with  
24                         the movable cursor and an error message is returned in response to a  
25                         selection of an object which cannot be processed utilizing the user defined  
26                         executable process.

28

1           The above as well as additional objectives, features, and  
2 advantages of the present invention will become apparent in the following  
3 detailed written description.  
4

00000000000000000000000000000000

1                   **BRIEF DESCRIPTION OF THE DRAWINGS**

2

3                   The novel features believed characteristic of the invention are  
4 set forth in the appended claims. The invention itself, however, as well as a  
5 preferred mode of use, further objectives and advantages thereof, will best  
6 be understood by reference to the following detailed description of an  
7 illustrative embodiment when read in conjunction with the accompanying  
8 drawings, wherein:

9

10                  **Figure 1** is a pictorial representation of a data processing  
11 system which may be utilized to implement the method and system of the  
12 present invention;

13

14                  **Figure 2** is a pictorial representation of a display screen within  
15 the data processing system of **Figure 1** which illustrates the display of a  
16 movable cursor and multiple user selectable objects which may be operated  
17 upon utilizing the method and system of the present invention;

18

19                  **Figure 3** is a pictorial representation of a display screen within  
20 the data processing system of **Figure 1** which illustrates the display of a  
21 movable cursor which has been graphically altered in appearance in  
22 response to an association of a user defined process with the movable cursor  
23 in accordance with the method and system of the present invention;

24

25                  **Figure 4** is a pictorial representation of the display screen within  
26 the data processing system of **Figure 1** which illustrates the display of a  
27 graphically altered movable cursor and the graphic selection of a particular  
28 user selectable object in accordance with the method and system of the  
29 present invention;

1                   **Figure 5** is a pictorial representation of a display screen which  
2 illustrates the display of a result of an execution of the user defined process  
3 upon the graphically selected user selectable object in accordance with the  
4 method and system of the present invention;

5

6                   **Figure 6** is a high level logic flowchart which illustrates the  
7 specification of a user defined process to be utilized in accordance with the  
8 method and system of the present invention;

9

10                  **Figure 7** is a high level logic flowchart which illustrates the  
11 association of a user defined process with a movable cursor in accordance  
12 with the method and system of the present invention; and

13

14                  **Figure 8** is a high level logic flowchart which illustrates the  
15 execution of a user defined process upon a particular user selectable object  
16 in response to a graphic selection of the object by a user utilizing a movable  
17 cursor in accordance with the method and system of the present invention.

18

CONFIDENTIAL

1           DETAILED DESCRIPTION OF PREFERRED EMBODIMENT

2  
3           With reference now to the figures and in particular with  
4 reference to **Figure 1**, there is depicted a pictorial representation of a data  
5 processing system **10** which may be utilized to implement the method and  
6 system of the present invention. As illustrated, data processing system **10**  
7 includes a processor **12** and a keyboard **14**. As is typical in such data  
8 processing systems, a display device **16** is also coupled to processor **12** and  
9 includes a display screen **18**. A graphic pointing device **20**, such as a mouse  
10 pointer, is also coupled to processor **12** and may be utilized, as those skilled  
11 in the art will appreciate, to graphically select an element within display screen  
12 **18** in a manner well known in the art. Data processing system **10** may be  
13 implemented utilizing any so-called "personal" computer, such as the  
14 International Business Machines Corporation PS/2 personal computer.

15  
16           Referring now to **Figure 2**, there is depicted a pictorial  
17 representation of a display screen **18** within data processing system **10** of  
18 **Figure 1** which illustrates the display of a movable mouse cursor **22** and  
19 multiple user selectable objects which may be operated upon utilizing the  
20 method and system of the present invention. As illustrated, multiple user  
21 selectable objects **24, 26, 28, 30, 32, 34, 36, 38, and 40** are displayed within  
22 display screen **18**. Such user selectable objects may comprise iconic  
23 representations of documents, files, folders, or the like. Similarly, those  
24 skilled in the art will appreciate that such user selectable objects may also  
25 comprise iconic representations of selected applications or utilities within data  
26 processing system **10**. Each user selectable object within display screen **18**  
27 may, as those ordinarily skilled in the art will appreciate, be graphically  
28 selected, utilizing graphic pointing device **22** by physically locating movable  
29 mouse cursor **22** above a particular user selectable object and thereafter

1 "clicking" or otherwise selecting the object utilizing a mouse button or other  
2 similar input device.

3

4                 With reference now to **Figure 3**, there is depicted a pictorial  
5 representation of display screen **18** of **Figure 2** within data processing  
6 system **10** of **Figure 1** which illustrates the display of a movable cursor which  
7 has been graphically altered in appearance in response to an association of  
8 a user defined process with the movable cursor in accordance with the  
9 method and system of the present invention. As illustrated, the appearance  
10 of movable mouse cursor **22** has been graphically altered and is now  
11 depicted as graphically altered mouse cursor **42**. Those having ordinary skill  
12 in this art will appreciate that any suitable graphical technique for indicating  
13 the association of a user defined process may be utilized to indicate that  
14 association and that the shape, color or physical appearance of movable  
15 mouse cursor **22** may be suitably altered to indicate that association. In the  
16 depicted embodiment of the present invention, the user defined process may  
17 comprise, for example, a specification of a particular series of alphanumeric  
18 characters which are to be searched for within a file listing represented by a  
19 selectable object within display screen **18**.

20

21                 Thus, if the user desires to examine each user selectable object  
22 within display screen **18** to locate each file or document having the letters "P,"  
23 "R," "O," "L," within the file name, a simple procedure may be defined for  
24 specifying that process. In a manner which will be explained in greater detail  
25 herein, that user defined process may be created and stored and thereafter  
26 selected for association with movable mouse cursor **22** to create graphically  
27 altered mouse cursor **42** in the manner depicted within **Figure 3**.

28

1               Next, referring to **Figure 4**, there is depicted a pictorial  
2 representation of display screen 18 within data processing system 10 of  
3 **Figure 1**, which illustrates the display of a graphically altered movable cursor  
4 and a graphic selection of a particular user selectable object in accordance  
5 with the method and system of the present invention. Thus, as illustrated  
6 within **Figure 4**, graphically altered mouse cursor 42 has been moved to a  
7 position overlying user selectable object 26. In this manner, as will be  
8 explained in greater detail below, the user defined process associated with  
9 graphically altered mouse cursor 42 will then be applied to user selectable  
10 object 26 upon the graphic selection of user selectable object 26, utilizing  
11 graphically altered mouse cursor 42. Thus, the graphic selection and  
12 "clicking" on user selectable logic 26 utilizing graphically altered mouse cursor  
13 42 will result in the execution of the selected user defined process on the  
14 contents of that user selectable object.

15  
16               With reference now to **Figure 5**, there is depicted a pictorial  
17 representation of a display screen 18 within data processing system 10 of  
18 **Figure 1**, which illustrates the display of a result of an execution of the user  
19 defined process upon the graphically selected user selectable object, in  
20 accordance with the method and system of the present invention. Thus, as  
21 illustrated within **Figure 5**, a search results listing 44 has been created which  
22 lists each file within user selectable object 26 which satisfies the search  
23 criteria set forth within the predefined process which has been selected by  
24 the user.

25  
26               In this manner, as those ordinarily skilled in the art will  
27 appreciate, a user predefined process may be created and associated with  
28 a movable mouse cursor and thereafter executed upon any arbitrarily  
29 selected object within the data processing system by the simple expedient of

1 graphically selecting a user selectable object utilizing the graphically altered  
2 mouse cursor. Of course, in the event the object selected is inappropriate  
3 for execution of the user defined process, an error message may be  
4 generated and returned to the user.

5

6 Referring now to **Figure 6**, there is depicted a high level logic  
7 flowchart which illustrates the specification of a process to be utilized with the  
8 method and system of the present invention. As depicted, the process  
9 begins at block **60** and thereafter passes to block **62**. Block **62** illustrates a  
10 determination of whether or not the user desires to define a process and if  
11 not, the process merely returns in an iterative fashion to await the initiation of  
12 the creation of a user defined process in accordance with the method and  
13 system of the present invention.

14

15 Still referring to block **62**, in the event the user does desire to  
16 define a process, the process passes to block **64**. Block **64** illustrates the  
17 entering of a process definition state. Those ordinarily skilled in the art will  
18 appreciate that a procedure may be created for specifying process definition  
19 and executed utilizing a so-called "Terminate and Stay Resident" (TSR)  
20 processing technique. That is, a process which is initiated utilizing a so-called  
21 "hot key" and which thereafter interprets keystrokes which follow the  
22 invocation of that procedure as keystrokes which are to be recorded for  
23 future utilization, rather than passed directly to the data processing system.

24

25 Next, the process passes to block **66** which illustrates the  
26 capture and storing of the keystrokes and other selected inputs, such as  
27 mouse movements or the like. Thereafter, the process passes to block **68**.  
28 Block **68** illustrates a determination of whether or not the process definition

1 has ended and if not, the process returns to block 66 to continue to capture  
2 keystrokes and selected user inputs.

3

4                   Once the process definition has ended, as determined at block  
5 68, the process passes to block 70. Block 70 illustrates the storing of the  
6 defined process and the process then passes to block 72. Block 72  
7 illustrates a determination of whether or not a second user defined process  
8 is to be defined and if so, the process returns to block 64 in an iterative  
9 fashion to begin the process definition procedure for a second user defined  
10 process. In the event no other process is to be defined, this procedure  
11 passes to block 74 and returns. A user may desire to utilize existing  
12 processes, such as macros, batch files, programs or the like. In such  
13 circumstances, the process detailed in **Figure 6** will not be necessary.

14

15                   With reference now to **Figure 7**, there is depicted a high level  
16 logic flowchart which illustrates the association of a user defined process with  
17 a movable cursor in accordance with the method and system of the present  
18 invention. As illustrated, this process begins at block 80 and thereafter  
19 passes to block 82. Block 82 illustrates a determination of whether or not  
20 cursor applied processing has been selected. If not, the process merely  
21 iterates until such time as the user selects a cursor applied processing  
22 procedure. Once the cursor applied processing procedure has been  
23 selected, the process passes to block 84. Block 84 illustrates the prompting  
24 of the user to select a predefined process. Recalling that the user may  
25 predefine and store numerous processes, it should be clear to those having  
26 ordinary skill in the art that the user may select one of several predefined  
27 processes for utilization with the cursor applied processing process. It should  
28 be noted that a reference to one or more existing processes such as macros,  
29 batch files, programs or the like, may be utilized in lieu of the creation of a

1 process as outlined in **Figure 6** above. Next, the process passes to block  
2 **86**. Block **86** illustrates a determination of whether or not the user has  
3 responded to the prompt by selecting a predefined process. If not, the  
4 process passes to block **88** which illustrates the generation of an error  
5 message and the process returns to block **84** in an iterative fashion.

6

7                 Still referring to block **86**, in the event the user has selected a  
8 predefined process for utilization with the cursor applied processing  
9 procedure, the process passes to block **90**. Block **90** illustrates the  
10 association of that predefined process with the movable cursor. Next, the  
11 process passes to block **92** which illustrates the alteration of the graphical  
12 appearance of the movable cursor in order to indicate to the user that a  
13 predefined process has been associated with that cursor. Thereafter, the  
14 process passes to block **94** and returns. Error handling of an invalidly  
15 specified process may be accomplished utilizing any technique known in the  
16 art.

17

18                 Finally, referring to **Figure 8**, there is depicted a high level logic  
19 flowchart which illustrates the execution of a user defined process upon a  
20 particular user selectable object in response to a graphic selection of that  
21 object by a user utilizing the movable cursor, in accordance with the method  
22 and system of the present invention. As illustrated, this process begins at  
23 block **100** and thereafter passes to block **102**. Block **102** illustrates a  
24 determination of whether or not the cursor has been utilized to graphically  
25 select an object within display screen **18**. In the event the cursor has not  
26 been utilized to select an object, the process returns, in an iterative fashion,  
27 to await selection by the user of an object within the display screen utilizing  
28 the movable mouse cursor. Next, the process passes to block **104**.

29

1               Block 104 illustrates a determination of whether or not the  
2 system is currently operating within the cursor applied processing mode and  
3 if not, the process passes to block 106 which illustrates the normal selection  
4 procedure. That is, that procedure which occurs normally when an object  
5 which has been graphically selected by the cursor is selected during normal  
6 processing. Thereafter, the process passes to block 108 and returns.

7

8               Referring again to block 104, in the event the data processing  
9 system is operating within the cursor applied processing mode, the process  
10 passes to block 110. Block 110 illustrates a determination of whether or not  
11 the object which has been selected is suitable for the selected predefined  
12 process. Those ordinarily skilled in the art will appreciate that in view of the  
13 fact that numerous user processes may be predefined, there may exist  
14 selectable objects within the data processing system which are not suitable  
15 for execution by a particular process. In the event the object selected is not  
16 suitable for the selected process, the process passes to block 112 which  
17 illustrates the generation of an error message. Thereafter, the process  
18 passes to block 108 and returns.

19

20               Referring again to block 110, in the event the object selected by  
21 the user utilizing the mouse cursor is suitable for the selected process, the  
22 process passes to block 114 which illustrates the execution of the selected  
23 process on the graphically selected object in response to a graphic selection  
24 of that object utilizing the movable mouse cursor. Next, the process passes  
25 to optional block 116 which illustrates the returning and display of the results  
26 of that process execution, if necessary or desired, and the process then  
27 passes to block 108 and returns.

28

1           The movable mouse cursor, of course, remain enabled within  
2 the cursor applied processing mode after selection of that mode as noted in  
3 **Figure 7** until the user elects to disable that mode. After disabling the cursor  
4 applied processing mode, the appearance of the movable mouse cursor will  
5 be restored to a normal graphic appearance and will thereafter operate  
6 normally.

7

8           Upon reference to the foregoing those skilled in the art will  
9 appreciate that the Applicants herein have created an intuitive and graphic  
10 technique whereby a user defined process may be created and thereafter  
11 associated with a movable cursor element and then applied to an arbitrary  
12 number of user selectable objects within a data processing system by the  
13 simple expedient of graphically selecting an object utilizing a movable cursor  
14 which has had a predefined user process associated therewith.

15

16           While the invention has been particularly shown and described  
17 with reference to a preferred embodiment, it will be understood by those  
18 skilled in the art that various changes in form and detail may be made therein  
19 without departing from the spirit and scope of the invention.

20